

Introduction:

The primary objective of endodontic treatment is to eradicate the infection and to prevent microorganisms from infecting or re-infecting the root or periradicular tissues. Therefore a thorough knowledge and understanding of the endodontic microbiota is necessary for the success of endodontic treatment. Although biomechanical preparation along with advanced irrigation systems removes majority of microorganisms, it is difficult to completely eradicate the microorganisms from the root canal system. *Candida albicans* is the most commonly isolated fungi from the root canals of teeth with previous endodontic treatment. The occurrence of fungi reported in the infected root canals varies between 7%-18%. This is due to the limitation in accessing the root canal system with its anatomical complexities. These microorganisms are resistant to routine therapy and they may persist despite treatment. Therefore intracanal medication is necessary to disinfect the root canal system.

Aims and Objectives:

To compare the antifungal efficacy of calcium hydroxide, 2% chlorhexidine, chitosan -silver nanocomposite and natamycin against *Candida albicans* and to observe which among these have superior action against *Candida albicans*.

Methodology:

Fifty single rooted mandibular premolars freshly extracted for orthodontic purpose were collected. Coronal portion of the teeth were sectioned at the level of CEJ by using carborundum disc and the working length was calculated. Biomechanical preparation was done up to F3 size proptaper rotary file. The outer

surface of the specimens were coated with two coats of nail varnish and apical foramen was sealed with type II glass ionomer cement. The teeth were sterilized by autoclaving at 121°C for 30 mins. The specimens were inoculated with *Candida albicans* (ATCC10231 Strain) in a glass tube. Samples were incubated at 37°C for 21 days with the renewal of *Candida albicans* every 3 days. Following the incubation period, the root canals were irrigated with saline and dried with paper points and the specimens were divided into five groups of ten samples each according to the intracanal medicament used. The medicaments were injected into the root canal by using a syringe with a gel etchant needle tip. Root canal orifices were sealed with paraffin wax and incubated at 37°C for seven days. At the end of seven days, the dentinal shavings were collected from the root canal using a peeso reamer and plated on 4% Sabouraud dextrose agar (SDA). The plates were incubated at 37°C and 91% humidity for 48 hours. After the incubation period, the growth of *Candida albicans* was assessed. The number of Colony Forming Units(CFU) of *Candida albicans* served as a measure of the antifungal activity.

Results:

In all the five groups, colony forming units were determined. Calcium hydroxide and chitosan–silver nanocomposite medicaments showed better antifungal efficacy when compared to the other groups. Also chlorhexidine showed better antifungal efficacy than natamycin.

Conclusion:

The results of this study showed that calcium hydroxide exhibited better antifungal efficacy against *Candida albicans*. Chitosan-silver nanocomposite also

exhibited better antifungal efficacy against *Candida albicans* when compared to 2% chlorhexidine and natamycin.

Clinical implications:

Chitosan-silver nanocomposite may be considered for use as an intracanal medicament along with other standard intracanal medicaments. However further research is needed to conclusively prove its usage as an intracanal medicament in clinical practice.